Earth-Friendly Gardening & Landscaping

The GreenMan

An ancient solution to modern pest problems

Millions of years ago, single-celled aquatic organisms called diatoms roamed the earth's seas, quietly died, and dropped to the sea floor where they formed fossilized deposits. Today, these ancient diatoms are being mined, processed, and sold to homeowners to help control a host of home and garden pests.

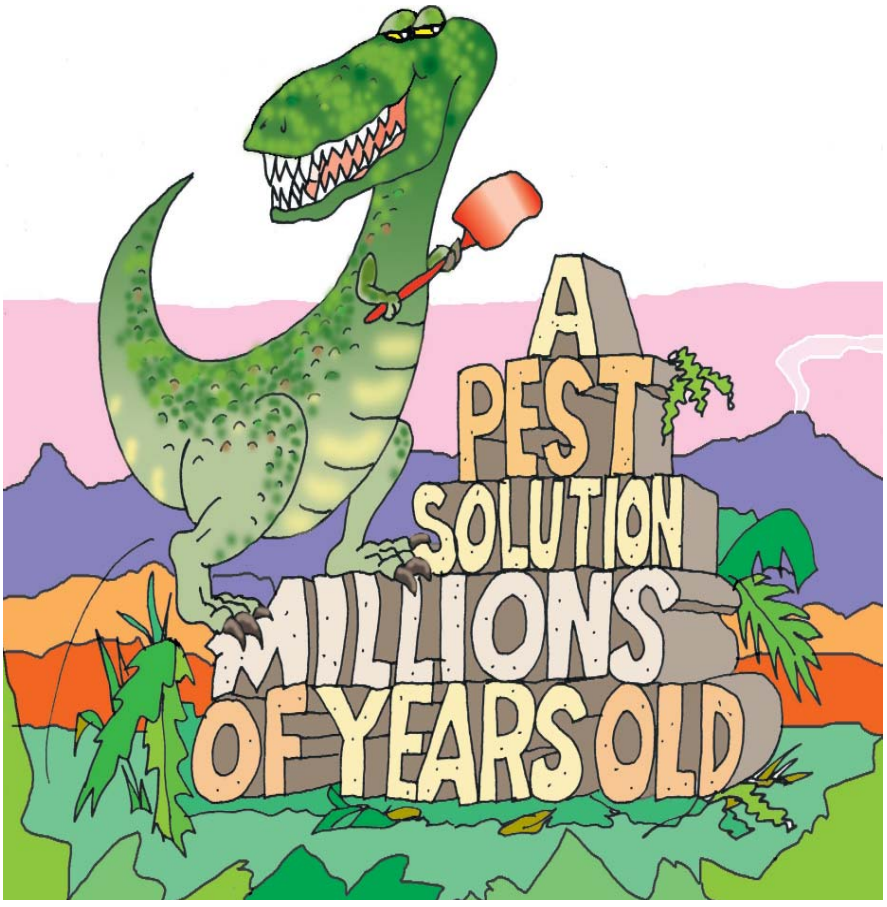
Called diatomaceous earth or "DE," this simple, white powdery substance is one of the most perfect pest control products available. It kills pests physically, in this case by puncturing the bug's protective exoskeleton until it dries up and dies.

Unlike most synthetic chemical or even botanically derived pesticides, there is no issue with toxicity or safe use around children and pets. In fact, DE is U.S.D.A.-approved as an animal food additive for parasite control. Farmers add it to beans and grains to prevent weevil and other pest infestations.

Chances are you've been exposed to DE already, whether added to your favorite toothpaste, mixed into silver and brass polish as a gentle abrasive, or used as a filter medium for everything from beer production to swimming pools. In fact, there are accounts of the Chinese using diatomite (fresh water diatom deposits) for pest control going back about four thousand years.

However, the complete story began about 30 million years ago, during the Tertiary period, as mammals started filling in the ecological niche formerly occupied by the dinosaurs. Within the earth's ancient waters, microscopic algae or phytoplankton gently floated with the currents, extracting silica to create protective cell walls, sometimes studded with impressive spines.

As these diatoms passed on, their fossilized remains or "skeletons" formed extensive chalky deposits in what are now dried lakes and sea beds, such as those in Nevada and Arizona. The process continues today, with approximately 16,000 species of phytoplankton carrying on this noble tradition from bubbling volcanic lakes to beneath frigid ice caps.



Back on land, man has turned geological mineral deposits into profit through hundreds of industrial and agricultural applications. The "hydrated amorphous silica" is mined, milled, and either heat-treated for use in pool filters, which makes it unsuitable for use around the home, or otherwise prepared and packaged for use as amorphous or natural diatomaceous earth, the product that finds its way into consumer goods ranging from paprika to cigars.

Fortunately, an ongoing interest in organic pest control has resurrected these dead diatoms and brought them to life in our yards and gardens.

While the ground-up diatoms feel like a silky talcum powder, under a microscope you would see a universe of lethal crystalline daggers. These micron-small fragments present razor-sharp edges and spikes that lacerate the waxy exoskeleton of most pests, often penetrating the elastic tissue between the hard plates of an insect's exoskeleton. The silica shards inflict extensive invisible wounds causing the insect to lose bodily fluids. And the diatom daggers are themselves an effective desiccant, further absorbing moisture from the insect. Within about 48 hours, the pest is mummified.

DE can attach itself to the tiny hairs that cover many insects, actually allowing an ant, for example, to pick up its own means of destruction as well as inflict damage on other ants in its colony. Should DE be ingested, the silica spikes will lacerate the insect's digestive system, also resulting in death by dehydration.

In the garden, slimy slugs and snails are soon turned to sushi, as are earwigs, aphids, thrips, mites and red spider mites, leafhoppers, fungus gnats, Japanese beetle grubs and sowbugs. Just use DE as a dust around the base of plants or apply directly onto foliage. Directions vary, but DE can be mixed with water, usually four tablespoons per gallon, and sprayed over large turf areas and garden beds. The DE becomes effective as soon as it dries. You can also make a DE slurry and paint it onto the trunks of trees to control numerous caterpillars and deter bark-gnawing borers.

Indoors, DE is deadly for silverfish, centipedes, cockroaches, fruit flies, houseflies, ants of every stripe, and even termites. Commonly available in an easily handled box or can, you can carefully sprinkle a light amount around window and door frames, pipes, cracks and crevices, along baseboards and countertops, under cabinets, behind refrigerators and outdoors along foundations.
Even pet owners have started to appreciate DE's effectiveness for safely and naturally controlling fleas and ticks, both indoors and out. Just sprinkle judiciously around animal bedding and in favorite resting areas, and consider spraying a wetted mixture on lawns and pet runs.

And though DE is non-toxic, excessive handling of the material will dry out skin. A dust mask or respirator should be used when applying large amounts as a dust. The product will remain viable whenever it is dry, although foliar applications will wash off after rainstorms. Do not worry about residual impacts on soil; DE contains an abundance of beneficial micronutrients, including magnesium, iron, boron, copper and manganese.

While pest-prone homeowners have long used boric acid as an effective tool against roaches and their ilk, products containing the substance pose significant toxicity issues in households with small children, especially crawling infants, as well as pets. Outdoors, boric acid is nonselective and toxic to numerous beneficial organisms, such as earthworms.

For safety's sake, rely on nature's friendly fossils, but remember to only use amorphous DE (ADE) or natural DE, stay away from filter powders and other pool supplies — *and follow all directions*. There are numerous brands and brandnames available, through catalogs, online, or at local hardware stores, nurseries, and garden centers.

The GreenMan Show is produced for County Cable Montgomery by the Department of Environmental Protection (DEP) and the Office of Public Information. It airs daily on Cable Channel 6 and can also be viewed on the Internet. For a complete schedule and online access, visit **www.greenmanshow.com.**

Joe Keyser is the author of the GreenMan column for the *Gazette Newspapers* in Maryland, and also host of The Greenman Show. A downloadable library of previous environmental articles. columns, and reviews are available online at greenman.askdep.com. Print copies are also available by contacting DEP at the following locations:

Montgomery County Department of Environmental Protection
255 Rockville Pike, Suite 120
Rockville, MD 20850
240.777.7770 fax 240.777.7765
email: help@askdep.com
www.askdep.com